

[10191/2262]

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant(s) : Hubert BENZEL et al.  
Serial No. : To Be Assigned  
Filed : Herewith  
For : METHOD FOR PRODUCING A SEMICONDUCTOR  
COMPONENT AND A SEMICONDUCTOR COMPONENT  
PRODUCED ACCORDING TO THE METHOD  
Art Unit : To Be Assigned  
Examiner : To Be Assigned

Assistant Commissioner for Patents  
Washington, D.C. 20231

**PRELIMINARY AMENDMENT AND  
37 C.F.R. § 1.125 SUBSTITUTE SPECIFICATION STATEMENT**

S I R:

Please amend the above-identified application before examination, as set forth below.

**IN THE SPECIFICATION AND ABSTRACT:**

In accordance with 37 C.F.R. § 1.121(b)(3), a Substitute Specification (including the Abstract, but without claims) accompanies this response. It is respectfully requested that the Substitute Specification (including Abstract) be entered to replace the Specification of record.

**IN THE CLAIMS:**

On the first page of the claims, first line, change "What is claimed is:" to  
--WHAT IS CLAIMED IS:--.

Please cancel, without prejudice, claims 1 to 15 in the underlying PCT application.

Please add the following new claims:

- 16. (New) A method for producing a semiconductor component having a semiconductor substrate, comprising the steps of:
- producing a first porous layer in the semiconductor component; and
  - producing one of a hollow and a cavity in the semiconductor component one of under and from the first porous layer, the one of the hollow and the cavity configured to be provided with an external access opening.
17. (New) The method according to claim 16, wherein the semiconductor component includes a multilayer semiconductor element.
18. (New) The method according to claim 16, wherein the semiconductor component includes a micromechanical component.
19. (New) The method according to claim 16, wherein the semiconductor component includes a pressure sensor.
20. (New) The method according to claim 16, wherein the semiconductor substrate includes silicon.
21. (New) The method according to claim 16, wherein the one of the hollow and the cavity producing step includes the substep of producing a second porous layer having a porosity of more than approximately 70% and less than 100% under the first porous layer.
22. (New) The method according to claim 21, wherein the second porous layer has a porosity of approximately 85% to 95%.
23. (New) The method according to claim 21, wherein the one of the hollow and the cavity is produced in the one of the hollow and the cavity producing step from the second porous layer by an annealing step.

24. (New) The method according to claim 16, wherein the one of the hollow and the cavity producing step includes the substep of forming one of an access opening and a hollow open on one side in one of a direction of the first porous layer and on a second porous layer.

25. (New) The method according to claim 24, wherein the one of the hollow and the cavity producing step includes the substep of one of partially and completely removing at least one of the first porous layer and the second porous layer via the one of the access opening and the hollow open on one side.

26. (New) The method according to claim 16, wherein the one of the hollow and the cavity producing step includes the substep of forming an initially planar hollow under the first porous layer, the initially planar hollow increasing in depth, the one of the hollow and the cavity resulting from the initially planar hollow.

27. (New) The method according to claim 21, wherein one of the first porous layer and the second porous layer is produced by at least one etching medium.

28. (New) The method according to claim 27, wherein the etching medium includes hydrofluoric acid.

29. (New) The method according to claim 27, wherein the etching medium includes at least one additive.

30. (New) The method according to claim 29, wherein the additive includes at least one of an additive configured to reduce bubble formation, an additive configured to improve wetting and an additive configured to improve drying.

31. (New) The method according to claim 30, wherein the additive includes an alcohol.

32. (New) The method according to claim 31, wherein the alcohol includes ethanol.

33. (New) The method according to claim 29, wherein a volume concentration of the additive is approximately 60% to approximately 100%.

34. (New) The method according to claim 32, wherein a volume concentration of the ethanol is approximately 60% to approximately 100%.

35. (New) The method according to claim 21, wherein at least one of first porous layer and the second porous layer is produced in the respective producing step by applying an electrical field between a top and a bottom of the semiconductor element and establishing an electric current.

36. (New) The method according to claim 21, wherein the second porous layer producing step includes the substep of selecting a process parameter so that an expansion rate of one of pores and hollows in the second porous layer is significantly higher than an expansion rate of one of pores and hollows for producing the first porous layer.

37. (New) The method according to claim 26, wherein the initially planar hollow forming step includes the substep of selecting process parameters so that one of pores and hollows of a second porous layer overlap one another in a lateral direction to form one of one single initially planar pore and one single initially planar hollow.

38. (New) The method according to claim 27, wherein a process parameter includes at least one of a doping of the semiconductor substrate, a doping of a silicon substrate, a current density in the etching medium, a hydrofluoric acid concentration in the etching medium, at least one additive to the etching medium and a temperature.

39. (New) The method according to claim 16, further comprising a high-temperature step for one of partially and completely removing hydrogen enclosed in the one of the cavity and the hollow.

40. (New) The method according to claim 16, further comprising the step of depositing an epitaxial layer on the first porous layer.

41. (New) The method according to claim 40, wherein the epitaxial layer includes a silicon layer.

42. (New) The method according to claim 40, wherein the epitaxial layer includes a monocrystalline silicon layer.

43. (New) A semiconductor component, comprising:  
a semiconductor substrate including one of a hollow and a cavity configured to be provided with an external access opening; and  
a porous layer arranged above the one of the hollow and the cavity.

44. (New) The semiconductor component according to claim 43, wherein the semiconductor component includes at least one of a multilayer semiconductor component, a micromechanical component and a pressure sensor.

45. (New) The semiconductor component according to claim 43, wherein the semiconductor substrate includes silicon.

46. (New) A semiconductor component, comprising a semiconductor substrate, the semiconductor component produced by a method including the steps of:  
producing a first porous layer in the semiconductor component; and  
producing one of a hollow and a cavity in the semiconductor component one of under and from the first porous layer, the one of the hollow and the cavity configured to be provided with an external access opening.

47. (New) The semiconductor component according to claim 46, wherein the semiconductor component includes at least one of a multilayer semiconductor component, a micromechanical component and a pressure sensor.

48. (New) The semiconductor component according to claim 46, wherein the semiconductor substrate includes silicon.--.

**REMARKS**

This Preliminary Amendment cancels without prejudice original claims 1 to 15 in the underlying PCT Application No. PCT/DE01/01516 and adds without prejudice new claims 16 to 48 . The new claims, *inter alia*, conform the claims to U.S. Patent and Trademark Office rules and do not add new matter to the application.

In accordance with 37 C.F.R. § 1.121(b)(3), the Substitute Specification (including the Abstract, but without the claims) contains no new matter. The amendments reflected in the Substitute Specification (including Abstract) are to conform the Specification and Abstract to U.S. Patent and Trademark Office rules or to correct informalities. As required by 37 C.F.R. § 1.121(b)(3)(iii) and § 1.125(b)(2), a Marked-Up Version of the Substitute Specification comparing the Specification of record and the Substitute Specification also accompanies this Preliminary Amendment. Approval and entry of the Substitute Specification (including Abstract) is respectfully requested.

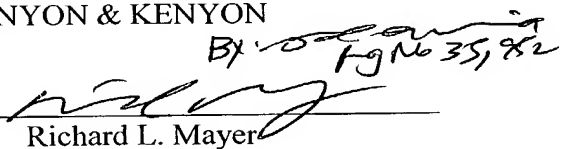
The underlying PCT Application No. PCT/DE01/01516 includes an International Search Report, dated October 16, 2001. The Search Report includes a list of documents that were uncovered in the underlying PCT Application. A copy of the Search Report accompanies this Preliminary Amendment.

Applicants assert that the subject matter of the present application is new, non-obvious, and useful. Prompt consideration and allowance of the application are respectfully requested.

Respectfully Submitted,

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Dated: 3/5/02

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